Hawaii Redistricting Online assists the Hawaii Reapportionment Commission, Advisory Councils, advocacy groups, and the public to create state legislative and congressional redistricting plans following the 2020 U.S. Census.

There is a 25 minute video that describes the steps to create an account and create plans using Hawaii Redistricting Online. If you haven't watched it, here's the link:

> Introduction to Hawaii Redistricting Online (YouTube video)

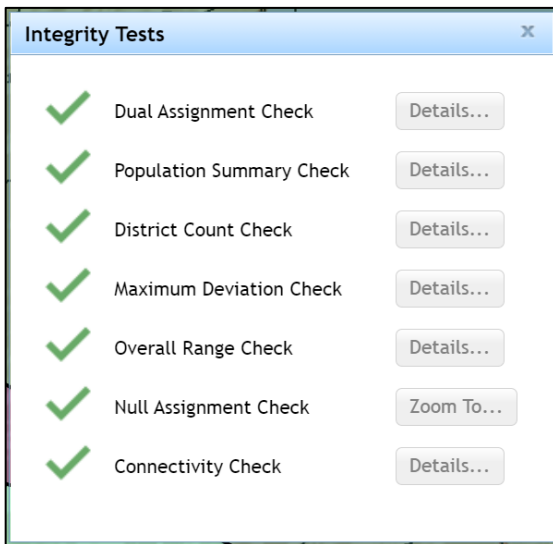This Click List shows how to use Check Integrity to check for errors in your redistricting plan.

Click List 8 – Review tab: Check Integrity

"Check Integrity" Button
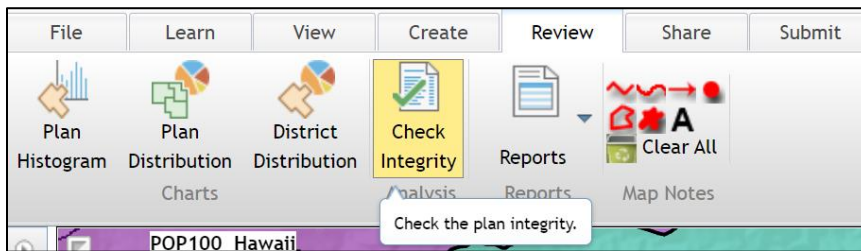
As you work on your plan, it's a good idea to periodically check that your plan is meeting the same guidelines and criteria used by the Commission.

Click "Check Integrity" on the Review tab.

The "Check Integrity" button performs several different tests.

If your plan passes all the tests you'll see all green check marks.

If you see a red X next to a test then you can click the "Details…" button to find and fix the error.

Let's look at a few of the tests that a plan might not pass and see how to find and fix whatever error caused the error.

**"Maximum Deviation Check" and "Overall Range Check"**
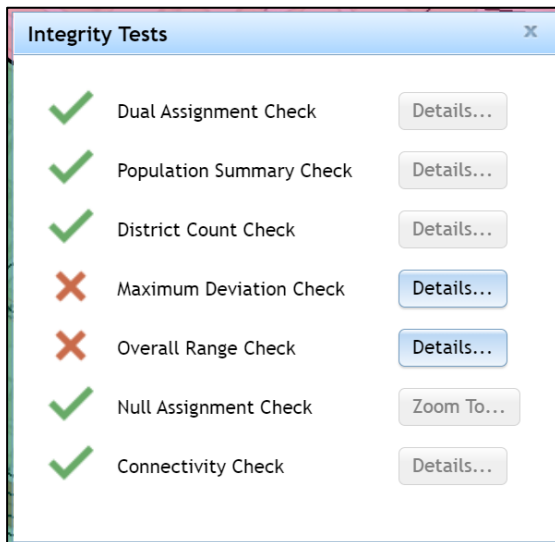
These two tests are related so we'll cover them both here.

There is an ideal population that is the same for every district in a plan. The population assigned to each district in the plan is compared to this ideal and a percentage difference calculated.

"Maximum Deviation Check" compares each district's deviation percentage with the plan standard, +/-10% for State Senate and State House and +/-1% for Congressional. Any deviation higher or lower than the plan standard is flagged as an error.

Click the "Details…" button to the right of "Maximum Deviation Check" to see the error list.
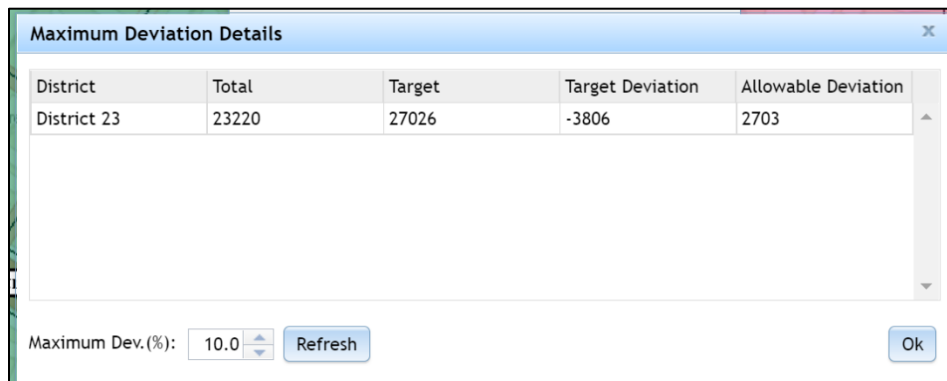

In this case, one district, District 23, exceeded the ideal by more than 10%.

Looking at the District Window we can see that District 23 is 14.08% below the ideal:

District	Color	Hide	Lock	TARGET	DEVIATION_PCT	DEVIATION	DISTRICT_POP
District 23				27,026	-14.08	-3,806	23,220

This is why it was marked as an error. No district shall be more than 10% above nor less than 10% below the ideal district population.

"Overall Range Check"
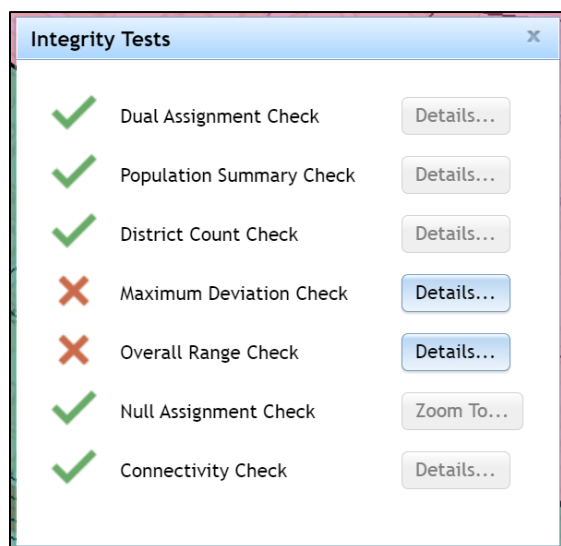
The 10% standard is even more strict than just looking at each individual district's deviation.

The 10% standard actually applies to the difference between the district with the highest deviation and the district with the lowest deviation.

"Overall Range Check" compares the highest and lowest district deviations with the plan standard, 10% for State Senate and State House and 1% for Congressional. A deviation range greater than the plan standard is flagged as an error.

Click the "Details…" button to the right of "Overall Range Check" to see the error list.

Here you can see that District 23 has the worst deviation, -14.08%.

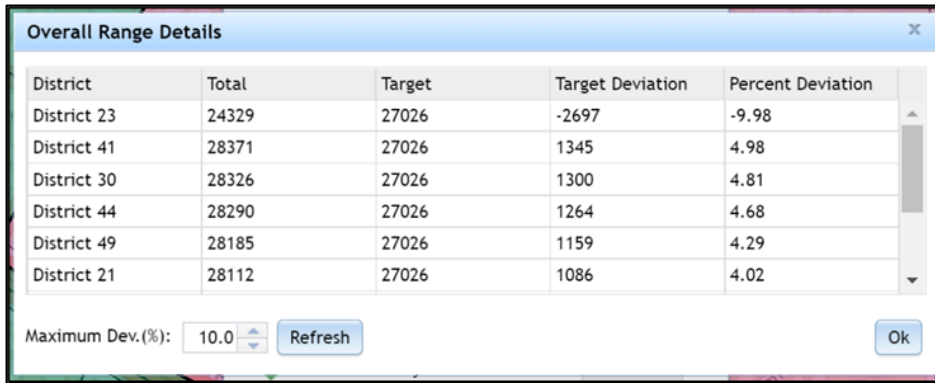The next worst is District 21 with +8.12% deviation.

The difference between the two, the lowest and the highest, is 22.20%, much higher than the 10% standard.

Using the Redistricting tools in the Create tab (covered earlier in Click List 7) I've tried to fix these errors by assigning some census blocks from District 21 to District 23. Then I run "Check Integrity" again.
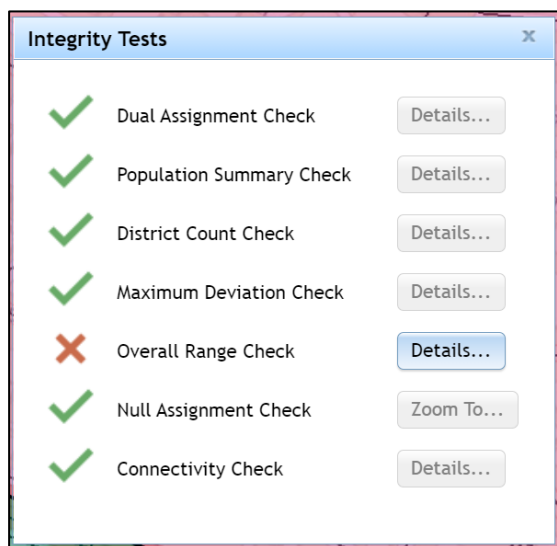
This time it's looking better, no single district is worse than the 10% standard, but the Overall Range is still worse than 10%.

Click the "Details…" button to the right of "Overall Range Check" to see the error list.
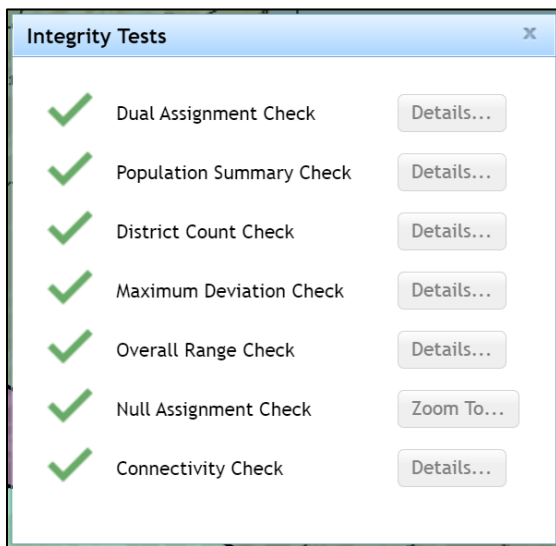

Here you can see that District 23 has improved but still has the worst deviation, -9.98%.

The next worst is now District 41 with +4.98% deviation.

The difference between the two is 14.96%, still much higher than the 10% standard.

Using the Redistricting tools in the Create tab (covered earlier in Click List 7), I continued working on my plan, periodically running "Check Integrity". Finally I see:

Now my plan has passed both the "Maximum Deviation Check" and the "Overall Range Check".

I can still work to improve my plan, but now I know it meets all the standard checks of the "Integrity Checks".

The "Overall Range Check" is a critical test. If your plan passes this test it will also pass the "Maximum Deviation Check".

It is rare to see "Dual Assignment Check", "Population Summary Check" or "District Count Check" errors so we'll not cover them here.

"Null Assignment Check" and "Connectivity Check" do occur so we'll cover them next.

"Null Assignment Check"
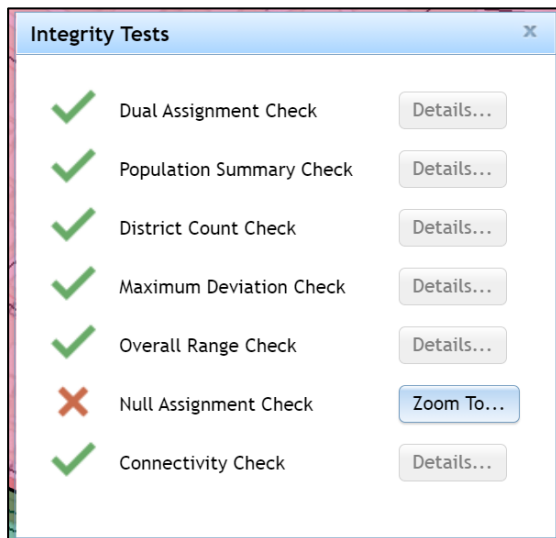
Every census block must be assigned to a district, none can be left "Unassigned" in a complete plan.

There are some very small census blocks and it's easy to overlook them when assigning census blocks to districts.

"Null Assignment Check" will find them for you.

Click the "Zoom To…" button to the right of "Null Assignment Check". The map will zoom to the error:
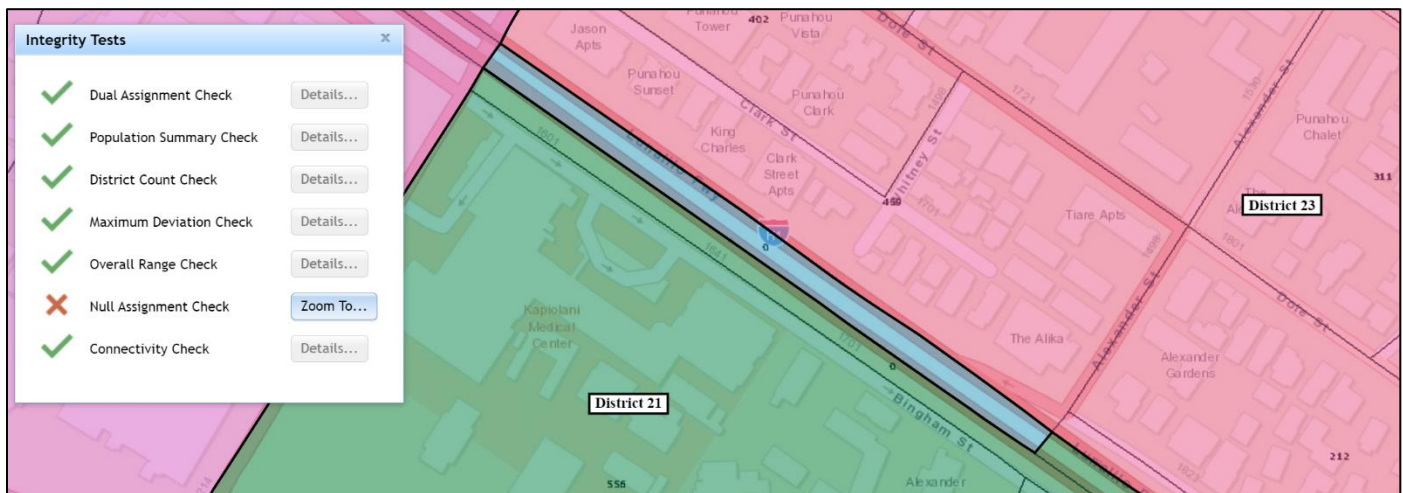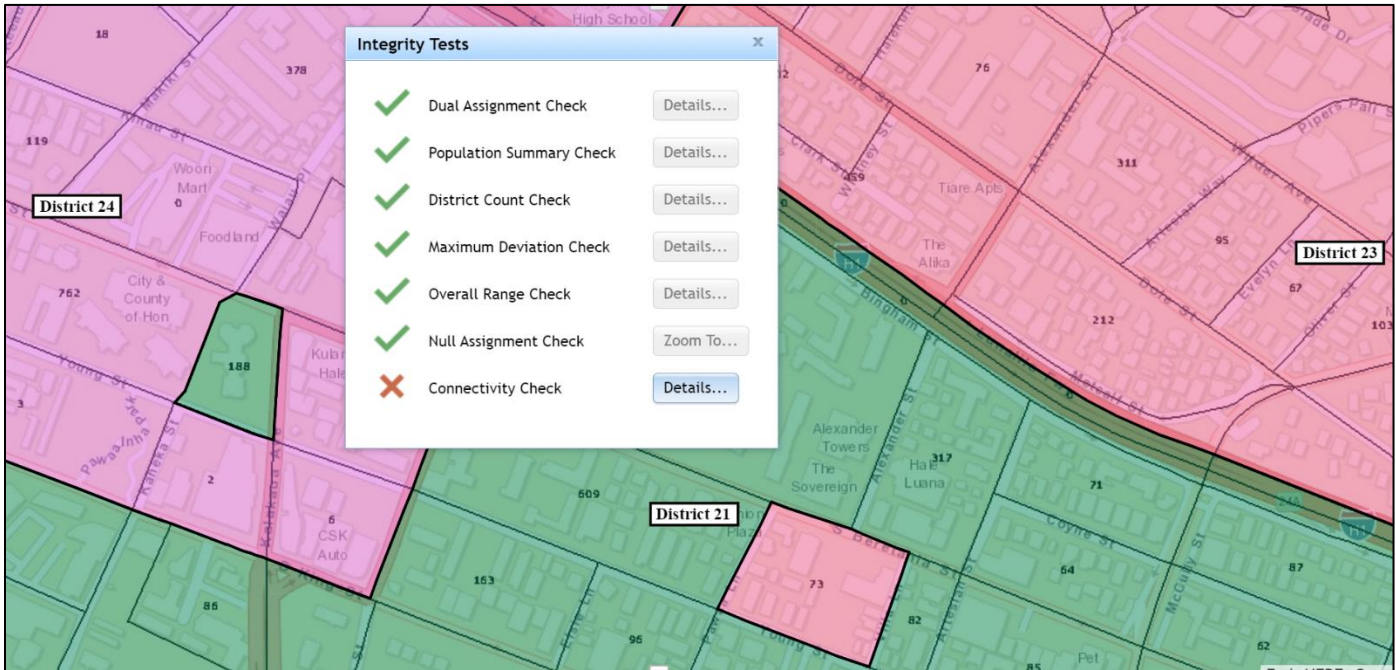

Use the Redistricting tools in the Create tab (covered earlier in Click List 7) to fix the error. In this case I would assign the blue "Unassigned" block to District 23.

Click the "Zoom To…" button again and if there is another "Unassigned" block, the map will zoom to it and you can fix it.

Continue clicking "Zoom To…" until you've fixed all the errors.

"Connectivity Check"

A complete plan cannot have discontiguous census blocks, that is, census blocks assigned to one district but totally contained within a different district. All census blocks assigned to a district must be connected. If any are not, the plan will not pass the "Connectivity Check". The map below has two discontiguous blocks and therefore did not pass the "Connectivity Check".

Click the "Details…" button to the right of "Connectivity Check" to see a list of the errors.
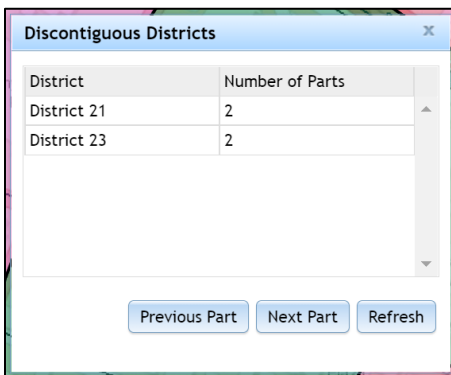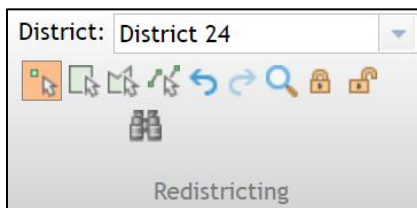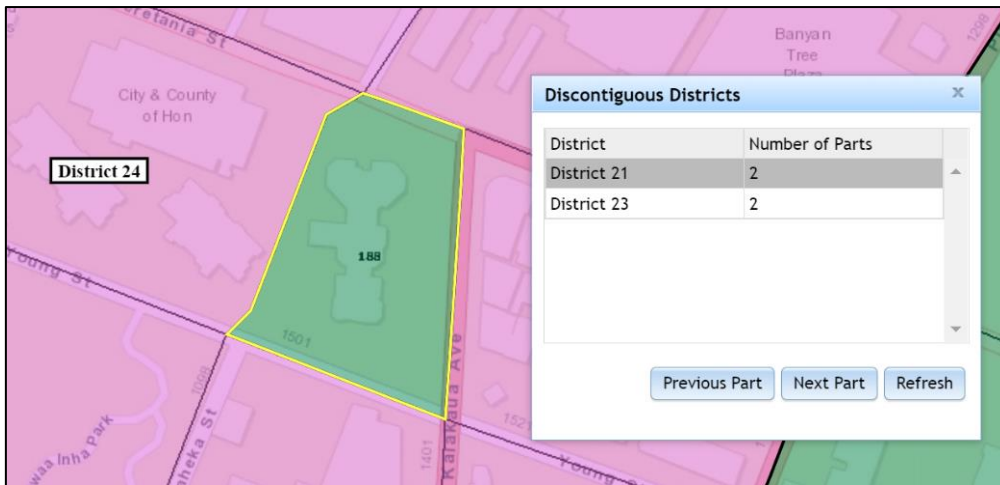

We see that District 21 (the green area) has two parts and that District 23 (the orange area) also has two parts.
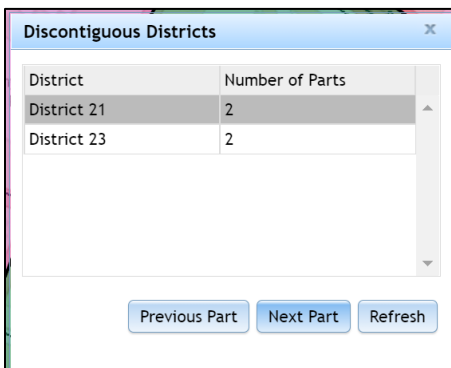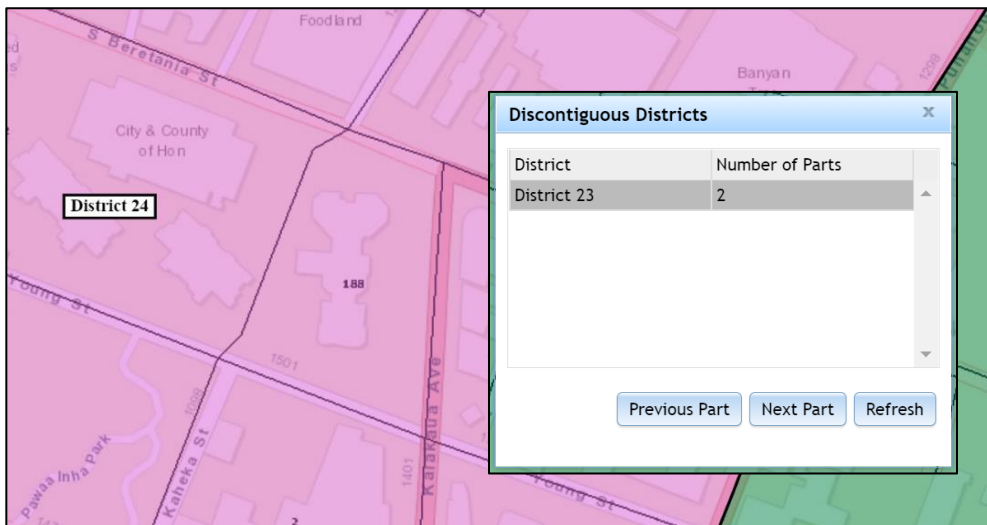

Click on "District 21" so it turns gray. Then click the "Next Part" button.

The map will first zoom to the larger area of District 21.

Click the "Next Part" button again and the map will zoom to the error.

I can see that this census block should be part of District 24 so I use the Redistricting tools in the Create tab (covered earlier in Click List 7) to fix the error.

After fixing the error, I click the "Refresh" button to update the error list.

Now I can select the next error and use the "Next Part" button to find the next error.

"Connectivity Check" – Special Case

There is a special case you might see that can be confusing so I'll explain it here.

There are census blocks covering the Northwestern Hawaiian Islands, now part of Papahanaumokuakea Marine National Monument. These census blocks need to be assigned and traditionally they have been assigned to the same district as the Waimanalo area on Oahu.

Congressional	CD2
State Senate	Senate 25
State House	House 51

These remote census blocks are not connected to Waimanalo but the Hawaii Redistricting Online app knows how to handle that and "Connectivity Check" will pass.
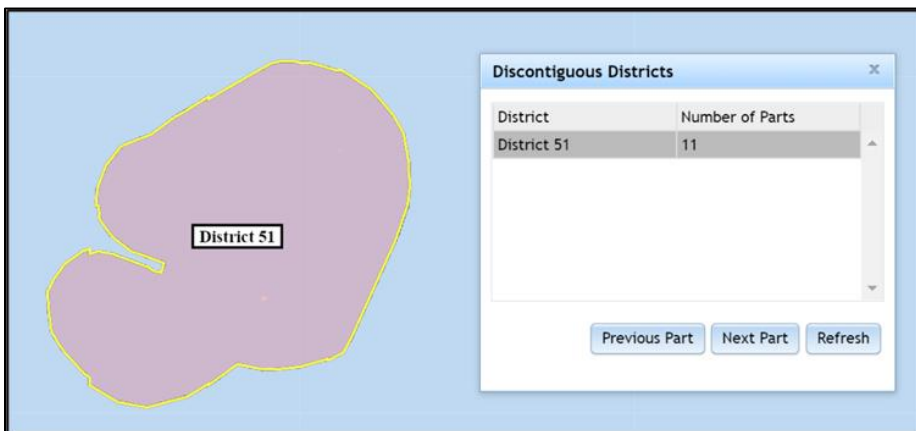
The special case occurs if you have a disconnected block in the Waimanalo area, then the list shows all of the small islands as errors also.

As you click the "Next Part" button, the map will first show the main part of the district, then each of the small islands.
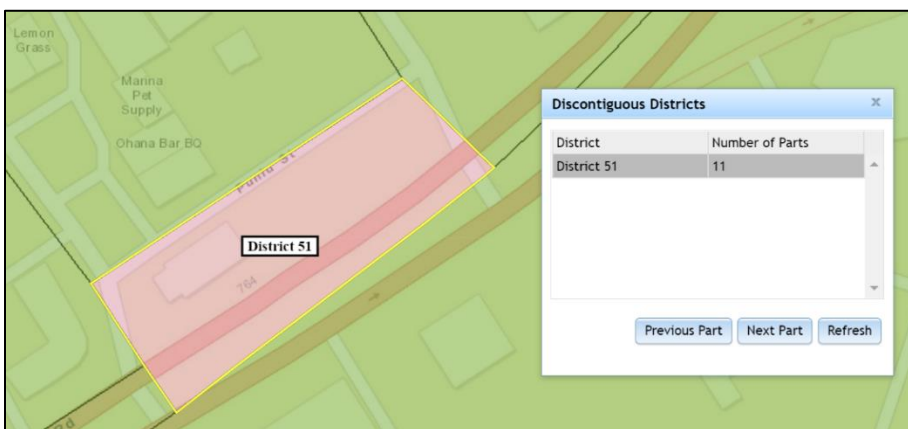
Continue clicking the "Next Part" button until you can finally see the error.

Fix the error and click the "Refresh" button and everything should be okay, you don't need to do anything with the small islands.